

Chalcid Forum

A Newsletter to Promote Communication Among Chalcid Workers

No. 18 - November 1995



Aperilampus sp.

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Editors' Notes

Another year has slipped by, and it seems likely that **Chalcid Forum** will now appear yearly rather than every six months. This is basically because your editors are both busy and lazy. Sorry, but as one grows ever older, the tendency is to become ever more committed to ever more projects while at the same time realizing that time is growing ever shorter. And, let's face it, the old brain becomes ever more confused, befuddled, and encumbered with endless amounts of trivia (mental plaque) that cannot be shaken loose no matter how hard we floss our minds. One of your editors (and we shall not say which) passed the half-century mark last year and is definitely out of the running as far as memory is concerned. [It would be nice to flip open the old skull and slide in another 8 megs of memory but the last time we tried that it hurt quite a bit.] In this issue we report on a number of positive techniques and achievements in the chalcidoid world, and as usual John Huber has provided a good listing of publications. On a sadder note, we are sorry to report the passing of Marcus Graham, one of the legends in Chalcidoidea (see Necrology, below). We cannot, at present, present an obituary, but next issue we hope to do so. Herein, however, we share a final letter that Marcus penned to his colleagues and friends. Would that we could all be as positive and gracious now as Marcus was at 80 years of age.

It was the privilege of the entire cast of **Chalcid Forum** editors to attend the Third International Conference of the International Society of Hymenopterists in Davis, California. Here we met many of our chalcidological colleagues and had

the chance to interact at a personal level.

The drawing for the masthead comes from Anthony Watsham's book "Ink Drawings and Watercolors of African Chalcid Wasps". [See **Book Notice**, below]

Research News

Jian Huang [Department of Plant Protection, Fujian Agricultural University, Fuzhou, Fujian, PRC]: "I continue to work on the parasitoids of whiteflies, scale insects, and the citrus leafminer, as well as on the Aphelinidae." [See also **Book Notice and Addresses**, below.]

Halit çAM [Gaziosmanpasa üniversitesi, Tokat, Turkey]: "I am working as a lecturer at newly established Gaziosmanpasa University, Faculty of Agriculture, Tokat, Turkey. My major field of study is entomology and I specialized on the taxonomy and biology of Eurytomidae in Turkey. I worked with Prof. Mikat Doganlar since 1986." [See **Addresses**, below.]

T. C. Narendran [Department of Zoology, University of Calicut, Kerala, India]: "I am now revising the Ormyridae of Indopacific region in collaboration with Dr. I. D. Naumann (Canberra, Australia). I have received innumerable specimens from various international museums for our studies. Dr. Nishida, Dr. Boucek, Dr. Noyes, Dr. Grissell, and Dr. Kamijo have sent me very interesting material of Ormyridae. I should greatly appreciate if any one sends me Indopacific Ormyridae for our revision, either as loan or otherwise. I am also willing to exchange Ormyridae with Oriental Chalcididae, Torymidae, and Eurytomidae."

K. Surekha [Indian Agricultural Research Institute, New Delhi]: "I have spent a year from April 1994 at the Natural History Museum, London, after having been awarded the "Darwin Fellowship '94" by the Department of Environment, Darwin Initiative for the Survival of Species, UK. I have been working on generic key to Eulophidae of Indian subcontinent as well as few publications on Eulophidae by collaborating with Dr. John LaSalle, CAB International Institute of Entomology. During my stay at NHM I have immensely benefited from he knowledge of Drs. Z. Boucek, John LaSalle, John S. Noyes etc. From May '95 onwards I will be continuing my postdoctoral research at Indian Agricultural Research Institute, New Delhi. I am intending to do the revisionary work on *Pediobius* Walker of southern Asiatic region so I am greatly appreciating the *Pediobius* specimens especially of s. Asiatic region for my studies as loan. I am pleased to exchange Indian eulophids as well as other chalcidoid specimens from our collections on your request."

Necrology

We were extremely dismayed to learn of the death of Marcus Graham on 29 March 1995. On 7 March Marcus wrote an open letter to his friends and colleagues which we reprint here exactly as written:

"As some of you will already know, my medical condition leaves me very little time. Regretfully, I can no longer write to you individually.

I would like to thank you all for the pleasure, help and interest you have given me, the thrills of discovery together.

My wife Nora has given me loyal support and without that much would have remained undone. In our travels together we have seen some wonderful things. I am glad that she will be remembered by the names of two species from Madeira.

New and exciting prospects seemed to be opening this last year-but I realize they are not to be.

I wish you all long life, good health, and the opportunity of contributing many things to the science which we love and to which we are dedicated."

Museum Reports

[Editors' Note: The following submission by Bob Zuparko detailing the holdings of U. C. Berkeley's chalcidoid collection contained an extensive list of genera of Chalcidoidea. Unfortunately we cannot reproduce all of the listings within the confines of this newsletter and we have summarized it. If more information is desired please contact Bob directly at the address given at the end of the notice.]

CHALCIDOID HOLDINGS OF U. C. BERKELEY

by Robert L. Zuparko

The Essig Museum (formerly the California Insect Survey) houses U. C. Berkeley's insect collection. The bulk of this material is located on the main campus, but the parasitic Hymenoptera are kept at the Laboratory of Biological Control, currently located at the Gill Tract in Albany. All holotypes were transferred to other institutions in 1993 (Zuparko, R.L. & J. Hamai. 1994. Pan-Pac. Entomol. 70(4): 313-317). Most of the Parasitica are organized in a synoptic collection. In the fall of 1994, I conducted a rough inventory of this material, though I did not make an exact tally. For pinned specimens, I counted each pin as a specimen, although some pins had multiple individuals, and some specimens had fallen off other pins. For slide specimens, I counted each slide as a specimen, although some slides had multiple individuals. I made few identifications (relying mostly upon identifications made by previous workers) and did not distinguish taxa below the generic level.

The number of Chalcidoidea specimens

are reported here by family and subfamily. Totals include pinned and slide specimens. Mymaridae and Trichogrammatidae are almost all slide-mounted, other families are mostly pin-mounted. Specimens currently on loan are also included in the totals. [The total number of Chalcidoidea is given as 18748 pinned and 5728 slides on hand; and 3293 pinned and 1134 slides on loan. Eds.]

AGAONIDAE: Agaoninae-15; Sycophaginae-20; unidentified-2
 APHELINIDAE: 3034
 CHALCIDIDAE: Chalcidinae-2056; Dirhininae-14; Haltichellinae-137; unidentified-8
 ELASMIDAE: 28
 ENCYRTIDAE: Encyrtinae-2849; tetracneminae-814; unidentified-1222
 EUCHARITIDAE: 198
 EULOPHIDAE: Entedontinae-386; Euderinae-125; Eulophinae-960; Tetrastchinae-1555; unidentified-221
 EUPELMIDAE: Calosotinae-3; Eupelminae-871; Metapelmatinae-7
 EURYTOMIDAE: Eurytominae-1760; Heimbrinae-5; Rileynae-43
 LEUCOSPIDAE: 254
 MYMARIDAE: Gonatocerinae-755; Mymarinae-1487; unplaced genera-4; unidentified-209
 ORMYRIDAE: 45
 PERILAMPIDAE: Chrysolampinae-91; Perilampinae-639; unidentified-3
 PTEROMALIDAE: Asaphinae-400; Ceinae-1; Cleonyminae-61; Colotrechinae-84; Diparinae-11; Eunotinae-130; Eutrichosomatinae-12; Macromesinae-5; Miscogasterinae-169; Panstenoniinae-1; Pireninae-6; Pteromalinae-4506; Spalangiinae-48
 SIGNIPHORIDAE: 76
 TANAOSTIGMATIDAE: 1
 TORYMIDAE: Megastiginae-45; Monodontomerinae-389; Toryminae-1229; unidentified-118
 TRICHOGRAMMATIDAE: Oligositinae-324; Trichogrammatinae-1163; unplaced genera-109; unidentified-102.

For additional information on this collection please contact Bob Zuparko, Laboratory of Biological Control University of California, Berkeley 1050 San Pablo Avenue, Albany, CA 94706; Tel.: (510) 642-4085; [bz@insect.berkeley.edu].

Book Notices

Ink Drawings and Watercolours of African Chalcid Wasps.

By Anthony Watsham, text by Gerhard Prinsloo. (Isteg Scientific Publ., Irene, South Africa. 36 pp., 1995)

[From the flyer]. "The selected ink drawings and watercolour washes ... provide an insight into the diversity, both in form and in function, of chalcid wasps. The exquisite and surprisingly detailed drawings depict these microscopic wasps with amazing accuracy, a skill that has been mastered by few. The book in hard cover with a dust-jacket comprises thirty-

six pages and includes four superb watercolours and nineteen ink drawings, each on a separate page. It is A4 in size and landscape in format. The colour plates, ink drawings and text are printed on woodfree Phoenix Imperial Natural White Half Matt (150 gsm). The laminated dust-jacket is printed on the same paper but of a lighter weight (134 gsm)." [This book was produced in a limited edition of 600 numbered copies and is available from the publisher at Isteg Scientific Publications, P.O. Box 836, Irene, 1675 South Africa (Fax: int. 27 12 6672494; Tel: int. 27 12 6672016)]

Systematic Studies on Aphelinidae (Hymenoptera: Chalcidoidea) of China. By Jian Huang. (Chongqing Publishing House, China, 366 pp., 1994.)

This monograph treats seventeen genera and 93 species of Aphelinidae are recognized, including 34 new species. The taxonomic history, current taxonomic notes, morphology, and biology of Aphelinidae are reviewed. Keys are given to Chinese genera and species with generic synonymy, diagnostic characters, phylogenetic relationships, systematic history, and present status. Finally, a list of the known genera and 155 species of Chinese Aphelinidae with their hosts and distribution is provided. [Editorial Note: We do not know why the species number conflicts with the above figure.] The author would like to exchange this book for other books on the families of Chalcidoidea by other chalcid workers.-Jian Huang

[The seed-eating Chalcidoidea of Palaearctics]. By M. D. Zerova and L. Ya. Seryogina. (National Academy of Sciences of Ukraine, Kiev Naukova Dumka. 237 pp., 1994; in Russian)

This book provides an invaluable summary of information about Palearctic seed-feeding chalcidoids. The work is divided into two parts, the first of which discusses general concepts of the evolution of phytophagy and presents two important summarizing tables: a seed-feeder/host plant list and a reciprocal host plant/seed-feeder list. Two hundred and twelve species of plants (in 16 families) are listed, and 120 species (not counting subspecies) of chalcidoids are associated

with their respective hosts. In the second part of the book, all 120 species of chalcidoids are treated in keys and discussed. The habitus of each is illustrated with line drawings, and the host seed is illustrated to show exit hole damage. The larvae of some species are illustrated. Chalcidoid species are distributed among 3 families as follows: Torymidae (*Megastigmus*-29, *Bootania*-2, *Syntomaspis* [= *Torymus*]-2), Pteromalidae (*Mesopolobus*-1), and Eurytomidae (*Tetramesa*-1, *Exeurytoma*-1, *Eurytoma*-28, *Bruchophagus*-34, *Systole*-19, *Pseudosystole*-2). Separate plant and animal indexes are given. This is a most important and thorough work and deserves wide recognition. No information was provided on how to obtain this book from the publisher.-Eric Grissell

Moranilini (Insecta: Hymenoptera) Moraniline wasps. By Jocelyn Berry. [*Fauna of New Zealand*, Vol. 33, 82 pp., 1995].

[Abstract, in part.] The tribe Moranilini has an Australasian (particularly Australian) distribution, and its members are mostly parasitoids and egg predators of coccoids. Three genera are recognized in New Zealand - *Aphobetus* Howard, *Moranila* Cameron, and *Opheloisa* Riley. Nine new species are described. Seven synonymies are proposed. Keys to the genera and [17] species of Moranilini found in New Zealand are presented. Host relationships are examined, and possible areas of origin of widely distributed species are discussed. Evidence from host relationships, biogeographic events, and phylogeny suggest that the Moranilini originated in Australia, and that a minimum of five dispersal events to New Zealand have occurred. A vicariance argument to account for the biogeography of the tribe would require some lineages of at least 80 million years duration; this is considered unlikely. It is not known whether the tribe Moranilini occurs in South America, but if it does then this would suggest a minimum age for the tribe of around 55 million years. The biological control of *Pseudococcus longispinus*, *P. calceolariae*, and *P. affinis* in New Zealand is discussed. A checklist of taxa, a host/parasitoid list, and species distribution maps are included. [This book may be ob-

tained from Fauna of New Zealand, Mt. Albert Research Centre, Private Bag 92-169, Auckland, New Zealand, Fax: 815-4201; Tel: 815-4211.]

Classification and evolution of the Oraseminae in the Old World, including revisions of two closely related genera of Eucharitinae (Hymenoptera: Eucharitidae). By J. M. Heraty. [Royal Ontario Mus. Life Sciences Contributions 157: 1-174, 1994.]

[Abstract, in part.] The Oraseminae and Eucharitinae are hypothesized to form a monophyletic group in Eucharitidae. These 2 subfamilies are redefined to incorporate new information from species found in the Old World. Keys to genera and species, descriptions, and biogeographic information are provided for the 4 genera of Oraseminae and the 2 general placed in the Psilocharitini. Four genera included in the Oraseminae are *Indosema* Husain and Agarwal; *Orasema* Cameron; *Orasemorphia* Boucek; and *Timioderus* Waterson. Two new genera of Eucharitinae are described: *Neolosbanus* (16 species) and *Psilocharis* (9 species). Fifty-six species of Eucharitidae are treated, of which 33 are described as new. Nine new combinations are proposed, lectotypes are designated for 9 species, and 10 new synonymies are proposed. The phylogeny of Eucharitidae is correlated with ant hosts. Myrmicinae are postulated as the ancestral host of Oraseminae, and Ponerinae as the ancestral host for Eucharitinae. Correlations between ant-host subfamilies and the phylogeny for Eucharitidae suggest adaptation to new hosts through colonization rather than coevolution. [This work may be obtained from University of Toronto Press, 10 St. Mary Street, Suite 700, Toronto, Ontario M4Y 2W8, Canada., Fax: (416) 978-4738; Tel.: (416) 978-2220.]

Toryminae (Hymenoptera: Chalcidoidea: Torymidae): a redefinition, generic classification, and annotated world catalog of species. By E. E. Grissell. (*Memoirs on Entomology, International*, 2:1-470, 1995; Associated Publishers, Gainesville, Florida.)

[Abstract, in part.] Two subfamilies of Torymidae are recognized: Megastigmi-

nae and Toryminae. The latter is redefined to include Monodontomerinae and Thaumatoryminae. Toryminae is revised and seven tribes are recognized of which two are new: Microdontomerini and Torymoidini. Fifty-four genera are recognized. The new genus *Gummilumpus* Grissell is described with *Neopalachia bouceki* Grissell, from Dominican Republic amber, as the type species. Ten species names are synonymized, and 82 new combinations are proposed. Lectotypes are selected for 25 species. Keys are given to subfamilies of Torymidae, and tribes and genera (except Torymini) of Toryminae. An annotated world catalog is presented for 53 genera and 497 nominal species names (426 valid, 71 synonyms); additionally, the single genus *Torymus* is treated as a checklist of 483 nominal names (317 valid, 166 synonyms). A review of biology is given with reference to phylogeny, and a host/parasitoid list is provided for all species (except *Torymus*). Appendices are given that treat genera removed from Torymidae, a summary of all nomenclatural changes, matrices of characters used for phylogenetic study, a complete summary of the numbers of taxa in Toryminae, and fossil species of the subfamily. Two alphabetical indexes are given, one to hosts and one to nominal names of all taxa. Nearly 700 cited references are listed in the literature section. [Copies of this work may be obtained from Associated Publishers; see under Miscellaneous, below.]

Techniques

Terri Taylor's note in *Chalcid Forum* 16 (p. 10) seems to have spawned a few comments on other approaches to the problem of preparing Chalcidoidea.

A SIMPLE YET EFFECTIVE METHOD FOR DRYING ALCOHOL PRESERVED SPECIMENS

by Simon van Noort
South African Museum
Cape Town

Following on Terri Taylor's (1993) report on drying methods, a further method, utilizing acetone as the effective agent, needs to be publicized. The acetone drying procedure is a simple and cost-effective method for drying weakly

sclerotised or small insects preserved in alcohol in preparation for dry mounting or scanning electron microscopy. The principle of the technique relies on the replacement of the alcohol contained in the specimen with highly volatile acetone, which is then speed evaporated under heat, leaving the specimen in a perfectly preserved state.

The technique was first described by Truman (1968) who used the method to preserve larval and adult mosquitoes. Walpole *et al.* (1988) applied the technique to representatives of Diptera, Hemiptera and Anoplura for SEM preparation. Tony Ware of the now disbanded Rhodes University fig team, headed by Steve Compton, was the first to apply this technique to Hymenoptera, specifically fig wasps, as an alternative to critical point drying for SEM preparation. Together with Rob Cross of the Electron Microscopy Unit at Rhodes University, they reported on the success of this treatment for the preparation of Agaonidae (Ware & Cross, 1989).

I have been using the technique for the mounting of fig wasps, and chalcids in general, for several years now. This includes both specimens preserved in alcohol (under sub-optimal conditions) for twenty plus years and freshly collected material from Malaise traps, yellow pan traps etc. The method works equally well for old and freshly collected material and is particularly useful for families with weakly sclerotised or small representatives. More recently I have subjected proctos (*s.l.*), cynipoids, ichneumonoids and smaller sized aculeates, such as dryinids to this treatment, with equal success. A colleague, Hamish Robertson, applies the technique successfully to ants. Many chalcids and proctos, being strongly sclerotised, do not really require this special treatment. I apply it as a matter of course, in an attempt to preclude any possibility of antennal or compound eye collapse. In some taxa, particularly ichneumonids, the gaster (metasoma) often distends when stored in alcohol. Acetone drying preserves the distention, creating an artificial appearance to the gaster, but this does allow for clear all round observation of the tergal and sternal plates. It is, nevertheless, possible to control the final extent of distention by allowing the specimen to dry out

until the gaster returns to normal, before placement in the acetone environment.

The acetone environment can be created by saturating a layer of cotton wool in the bottom of an airtight glass (or acetone-proof plastic) container with acetone and placing or pinning the specimens on some sort of platform (I use a piece of SPX foam) above the cotton wool. Specimens may either be placed directly into the acetone environment from alcohol or first mounted. For direct placement it is best to float the specimens out of the alcohol onto thin card, as it is essential to achieve the desired position for later mounting at this stage. A certain amount of manipulation can be carried out after acetone saturation and before drying, but the final position has more or less been determined at this point. Alternatively the specimen can be micropinned and double mounted (the synthetic "polyporous" silicon strip is not affected by acetone) or card mounted prior to placement in acetone vapour. I have used both water soluble glue and shellac gel (with little success) for card mounting. The adhesive must be allowed to dry sufficiently before placement in the acetone environment, so that the properties of the glue are not affected. Water soluble glue turns opaque and shellac gel loses its adherence properties. The latter is presumably as a result of the alcohol in the gel being replaced by the acetone and affecting the resultant bond. It is absolutely critical to achieve a balance between the glue drying sufficiently and the specimen remaining sufficiently wet to prevent any collapsing prior to acetone treatment. This sounds as if it involves much fussing, but with a bit of experimentation it is not difficult to get the timing right. I find that the ease of handling mounted specimens outweighs the disadvantages involved with gluing the specimen first.

The specimens are left for a minimum of three hours in the acetone jar, although no ill effects arise if they are left overnight, before removal and placement under a desk lamp (close to the bulb) for at least half an hour. A 60-watt bulb provides sufficient heat to speed dry the volatile acetone, leaving the specimens in a well preserved and uncollapsed state. With this method, good results can be achieved quickly and at low cost without

requiring access to freeze drying or critical point drying equipment.

LITERATURE CITED

- TAYLOR, T.L. 1993. *Chalcid Forum*, 16: 10
 TRUMAN, J.W. 1968. *Annals of the Entomological Society of America* 61: 779-780
 WALPOLE, D.E., COETZEE, M. & LALKHAN, C.M. 1988. *Journal of the Entomological Society of Southern Africa* 51: 293-296
 WARE, A.B. & CROSS, R.H.M. 1989. *Proceedings of the Electron Microscopy Society of Southern Africa*. 19: 39-40

ANOTHER METHOD OF DRYING CHALCIDOIDS

by David P. Cowan

Department of Biological Sciences
 Western Michigan University
 Kalamazoo Michigan

I am afraid that I am not well plugged into the network of chalcid workers and the methods I write about here may be old hat to most. The distortion of dried chalcid specimens is of course a well known problem; especially for specimens collected into alcohol. From what I have learned in the literature, the solution to this is critical point drying which requires fairly expensive equipment, and I am informed by some can be dangerous. For years, our electron microscope technician has been preparing small arthropods by aldehyde fixation, dehydration to 100% alcohol, and then through hexamethyldisilazane (HMDS). The HMDS is allowed to evaporate leaving specimens that show no collapse.

I have adapted this method to specimens that I collected into 95% ethyl alcohol with a malaise trap. The results, I think, have been good and work well not only for chalcids but any soft bodied insect including braconids, Diptera, aphids etc. I remove the desired specimens from the trap jar, rinse in clean 95% alcohol, transfer them to 100% alcohol, change this once, and then transfer them through two baths of HMDS. I then allow the HMDS to evaporate and this leaves the specimens ready for mounting on cards or points. The specimens are of course brittle and must be handled with care.

HMDS is nasty stuff and must be handled with great caution: no contact with the skin, and no breathing fumes. Always work under a hood. This chemical is not exorbitantly priced and only small amounts are needed for a sample of several dozen insects. HMDS is available from Polysciences, Inc. Warrington, PA

18976 (1-800-523-2575), Catalog # 00692.

[Editors' Note: Some additional information and literature concerning this subject was given by Bryan V. Brown in *Fly Times* No. 11, Oct. 1993 and we reprint this here as a supplement to David's note above.]

**A FURTHER CHEMICAL
ALTERNATIVE TO CRITICAL-
POINT-DRYING FOR
PREPARING SMALL (OR LARGE)
FLIES**

by Bryan V. Brown

Previously, I wrote about the use of Peldri II as a chemical alternative to critical-point-drying (CPD) (Brown, 1990). Using Peldri II for specimen preparation has the advantage of not requiring expensive equipment and huge canisters of CO₂, but the chemical is somewhat expensive and requires some equipment, i.e. a hot plate.

Recently I came across a material that seems to overcome all the drawbacks of Peldri II. This chemical, called hexamethyldisilazane (HMDS) is readily available and cheap, costing \$18.00/250g, versus \$58.00/250g for Peldri II. No heating or cooling is needed for using HMDS: one merely dehydrates specimens to 100% alcohol, then do two soaks of 1/2 hour in pure HMDS (i.e. change the HMDS once). I use small vials for the soaks. After the second soaking, I pour the HMDS and flies into shallow depressions or small dishes, and allow the liquid to evaporate under a fume hood. Specimens come out exactly like CPD prepared specimens, ready for SEM or for general mounting for the collection. Other users agree, finding that HMDS is just as or more effective than CPD for producing perfect specimens of various tissues (Adams et al., 1987; Nation, 1983). Note for larger samples (for instance, 50 small flies at once), I recommend an extra change of HMDS.

LITERATURE CITED

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- BROWN, B.V. 1990. Using Peldri II as an alternative to critical point drying for small flies. *Fly Times*, 4, 6.

NATION, J.L. 1983. A new method using hexamethyldisilazane for preparation of soft insect tissues for scanning electron microscopy. *Stain Technology*. 58: 347-351.

Miscellaneous

**COMPUTERIZED DATABASE OF
WORLD CHALCIDOIDEA**

by J.S. Noyes

A comprehensive database covering all aspects of the taxonomy, biology, distribution, behaviour, physiology and economic importance of the world's Chalcidoidea.

INTRODUCTION

The superfamily Chalcidoidea currently includes about 20,000 described species and has the widest host range of any parasitic insect group, with more than 300 arthropod families and 25 plant families acting as hosts. Through their interaction with these organisms chalcidoids play a critical role in the stability of most kinds of ecosystem. As natural enemies, Chalcidoidea may be chosen in preference to the use of pesticides in pest management programmes. The success of a biological control programme often depends on the correct identification of parasitoids since this gives access to relevant information. In addition to information being scattered through many thousands of separate publications, the situation is complicated further by the dynamic state of zoological nomenclature, species often appearing under several quite different names. Furthermore, much published information is unreliable because of host or parasite misidentifications.

THE DATABASE

The database makes available information by using a completely up-to-date, established taxonomic framework. It is the most complete catalogue and bibliography of this group in the world. In turn, the framework provides a sound platform for storing, and making accessible, published information on the biology, diversity, physiology, behaviour and economic importance of the Chalcidoidea.

The Natural History Museum is an ideal place to undertake this work. Almost all entomological literature is easily accessible within the museum and several of the top chalcidoid taxonomists are on site or are frequent visitors to the museum. In addition, the museum employs specialists on other groups that may act as hosts. Their expertise is

available for comment on host identifications, etc.

DETAILS OF THE DATABASE

The database uses Borland's "Paradox 4.0". This was chosen in preference to other systems because it is extremely user friendly and very flexible with regards to even the most specialised search.

The database is an extremely powerful research tool because it allows for rapid access to information that might be important to workers in any aspect of entomology, especially biocontrol. To date, priority has been given to adding useful biological and other information but it is hoped that in the near future its performance and user interface can be improved.

The database is relational and consists of two parts:

- A. The taxonomic/biological part which deals with taxonomy, hosts, key words (for references to physiology, behaviour, etc.) and distribution. All stored information is linked directly to the bibliography so that its original source can be determined. The part dealing with the biology and hosts of chalcidoids includes a field which indicates the reliability of a particular record. This part currently includes 50,000+ host and 35,000+ separate distributional records (in addition to any cited with the host records or as type localities). The taxonomic part gives details on all aspects of the taxonomy of chalcidoids, including original descriptions, synonymies and new combinations. This part also provides a link between any cited taxonomic name, including all known combinations and misspellings, and the currently accepted valid name. Included here are 44,000 cited names.
- B. The bibliographic part contains reference to nearly all papers ever published on Chalcidoidea. Where possible, each reference has been checked for accuracy and the actual date of publication is included. Each reference also includes three key words. About 30,000 references are included.

The database should be available on CDrom by the end of 1998. However, it is currently being offered for commissioned searches in an attempt to raise funds. These funds will be used to employ trained keyboarders to add recently

published biological and other information into the database.

Some examples of searches:

- list all chalcidoid parasitoids of a given host family, genus or species, with or without sources cited
- list all hosts of a given chalcidoid genus or species, with or without sources cited
- output a complete catalogue of any chalcidoid family, genus or species, including host, distributional and other data, with sources cited
- list of all chalcidoid species of a family or genus known from a given zoogeographic region, country or state, with or without sources cited
- list all papers of any author on Chalcidoidea
- list references concerned with a particular subject through scanning the titles and keywords of each reference in the reference database

Information resulting from commissioned searches is normally produced as hard copy, but in special circumstances it may be made available as electronic copy.

DETAILS OF SOME INCLUDED INFORMATION

Taxonomy

- cited names/valid names [including all misspellings and combinations
- reference for original description and subsequent taxonomic treatment (revisions, redescriptions, new combinations, synonymies, misidentifications, etc.)
- type designations (including type-species, lectotypes, neotypes)
- primary type depository
- type locality

Biology and Hosts

- source of information
- primary host
- parasitoid host (for hyperparasitoids)
- associated plant
- other associates (eg. for parasitoids reared from host in a gall other than primary gall maker)
- host family
- country of record
- parasitoid type (internal, external, phytophagous, hyperparasitoid, etc)
- "reliability score" for identification (both parasitoid and host)
- keywords (110 predefined)

Distribution

- source of information
- zoogeographic region
- country
- state or province (for larger countries)
- "reliability score"

References

- full reference, including author(s), title, journal/book/etc. (in full), language, keywords (110 predefined)
- source of summary (if available)
- date of publication (if known)

Additional Information

If you want more information on obtaining a complete/part copy of the database or you would like a specialized search on the database, please give details on a separate sheet sent to Dr. J.S. Noyes, Dept. of Entomology, The Natural History Museum, Cromwell Road, LONDON, SW7 5BD, England; Tel.: (071)-938-9328, Fax.: (071)-938-8937, [E-mail jsn@nhm.ac.uk].

New Publication:

Associated Publishers (P.O. Box 14103, Gainesville, Florida, 32614-0103, FAX (904) 371-4071) announced a new monographic series on entomology called *Memoirs on Entomology, International* (ISBN prefix: 1-56665-X). Three volumes have been published, with several more to follow, including an important work on Eupelmidae by Gary Gibson. Please contact Virendra K. Gupta, Editor/publisher for additional information. Note that this is a new series and does not replace the *Memoirs of the American Entomological Institute*, which is now edited by David Wahl.

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Recent Literature

Compiled by John Huber, CNC
[to end June, 1995]

All titles and journal abbreviations should be checked by the reader for accuracy if they are to be quoted in scientific

papers. Strictly taxonomic references are marked with an asterisk (*). The catalogue by De Santis & Fidalgo (1994) is noteworthy. (It is available for US\$19.00 from Editorial Hemisferio Sur S.A., Pasteur 743, 1028, Buenos Aires, Argentina.)

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